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Review and Approvals

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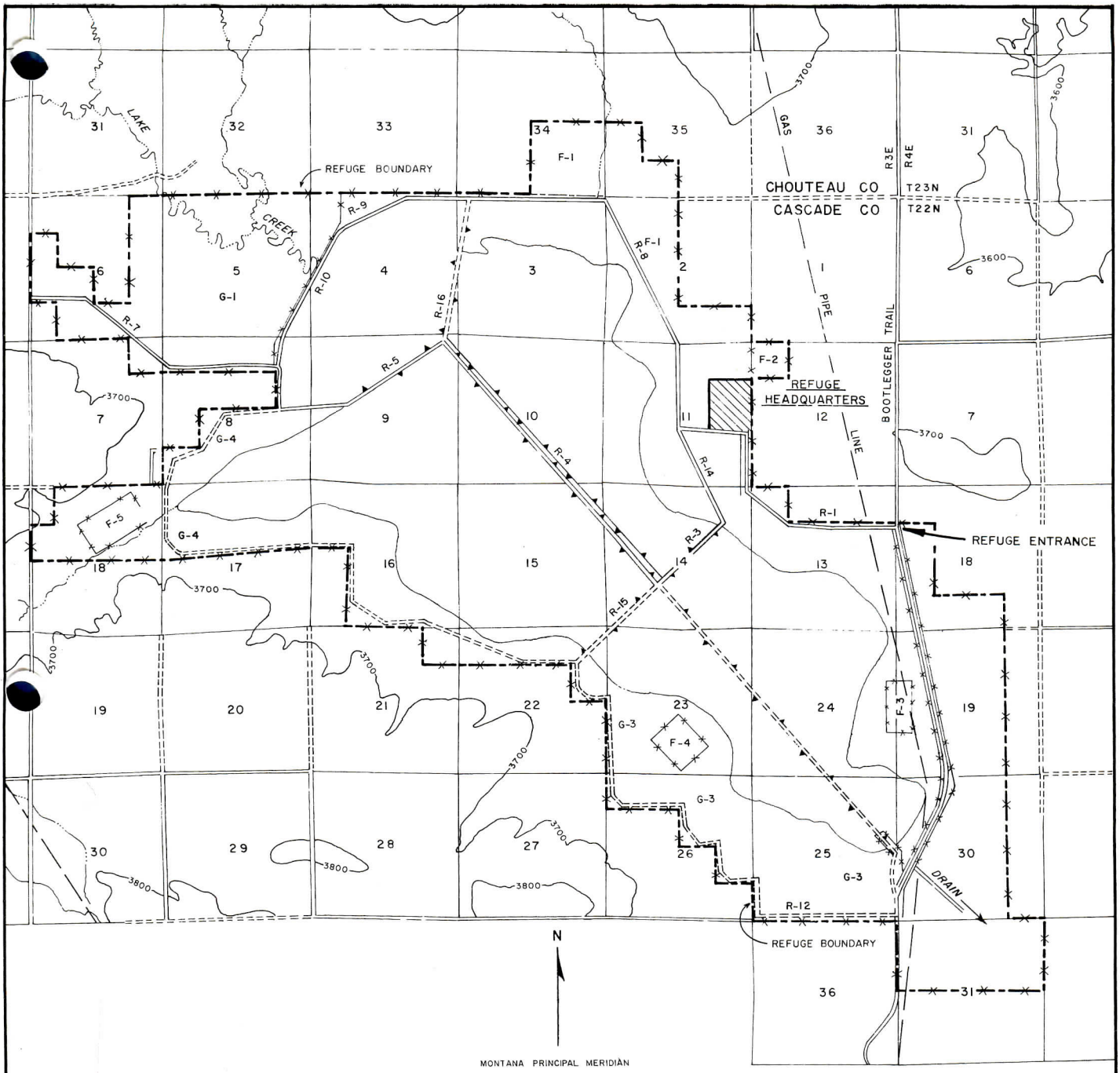
Submitted by Date

Benton Lake National Wildlife Refuge

Area Office Date

Regional Office Date



UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

BENTON LAKE NATIONAL WILDLIFE REFUGE

CASCADE AND CHOUTEAU COUNTIES, MONTANA

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I. GENERAL

A. Introduction

Benton Lake National Wildlife Refuge was established on November 21, 1929, by presidential executive order. The refuge contains about 5480 acres of short grass prairie surrounding the old glacial lake bed. This generally dry lake basin was subdivided with dikes in 1960-61 and a pumping station and water delivery system constructed. Irrigation return flows into Muddy Creek are pumped through a five and one-half mile 48 inch concrete pipe in the Lake Creek drainage where they then flow ten miles east down the channel to the refuge. Refuge headquarters are located about 12 miles north of Great Falls, Montana, via the Bootlegger Trail. Record floods, oil spill, and botulism affected this year's program.

B. Climatic and Habitat Conditions

Winter: Frequent but moderate snowstorms produced above normal snowfall. Winds were below normal and caused little or no drifting. Average annual snowfall is 57.8 inches. The 1977-78 winter produced 70.6 inches. Longevity of snow cover set a new record of 83 days, previously 66 days. January and February snowfall set an all-time record of 54.3 inches.

Spring: Thawing weather began in early March and the first surface runoff into the refuge was noted from the south on March 12, 1978. By the 19th of March Units 4 and 6 had received significant amounts and Units 1 and 3 were starting to receive local area runoff. The rapidness of the runoff washed considerable silt loads from surrounding farm fields, caused considerable road damage as culverts couldn't carry the flows, and did some minor fence damage. Most of the local snow cover was gone by the end of March when a new record high temperature of 78° was set for March 29.

Lake Creek runoff was first noted on March 20 and for several days it came faster than our structures could accommodate, then flows gradually tapered off. Most snow melt runoff was received by mid April. Flood damage on Lake Creek included two of our main structures which provide farm crossing on the Burgmier Ranch. Teton County lost one bridge just west of the refuge and about half of a road fill crossing one mile further west. Refuge Units 1 and 2 dikes were overflowed but sustained only minor damage. Refuge impoundments had about two feet of ice cover at breakup. Severe scouring action of the flood affected submerged aquatics in Units 1 and 2. Unit 5 was the least affected and provided the best food supply for early nesting ducks.

High winds (60 miles per hour) were received in April, causing much concern for unit dikes.

Summer: Above normal rainfall continued to produce occasional runoff down Lake Creek, including several thousand gallons of crude oil on June 1, from Phillips Petroleum Inc. pipeline which crosses Lake Creek about five miles west (upstream) of the refuge. Evaporation losses were far less than the forty-six inches recorded at the refuge in 1976 and 1977. High water levels were reached in the units about May 10, 1978. It wasn't until early September that water levels dropped back to the design capacity of the dikes. The master planned drainage facilities were never constructed, therefore, water losses are principally by evaporation.

Hail storms were more prevalent than last year and an August storm hit local wheat fields and the cattail in Units 1 and 2. The cattail turned brown before our first frost. Wildlife losses were not noted.

Fall: October was warmer and dryer than normal. The first sheet ice formed along shorelines on October 31. High winds (81 miles per hour peak gusts) on November 4 were followed by the first major winter storm on the 9th to 13th of November with eleven inches of snow accumulating. Impoundments were immediately frozen over with only a few birds remaining by the 10th. A total of 28 inches of snow was received by the end of the year. Storms were more intense than have been experienced in recent years. Average temperatures for November and December were ten degrees colder than normal and winds were slightly above normal.

County and refuge roads were closed by drifting snow on several days in December. Snow cover began on November 9, 1978, and continued through the end of the year. The high winds did cause some baring of high spots and plowed fields, but probably won't compensate for the severity of the weather as far as resident wildlife survival is concerned.

Table I provides comparative weather statistics for 1978. The official weather station is located at the Great Falls Airport. 1978 was the third coldest year on record for Great Falls since 1892. Precipitation and evaporation are also measured at the refuge headquarters.

TABLE I

WEATHER DATA FOR 1978

	Great Falls					Refuge
	Temperatures (F)					
	High	Low	Depart	Precip.	Snow	Precip.
January	42	-15	-12.8	1.68	19.3	1.32
February	45	-20	-12.1	1.21	16.8	.89
March	78	-19	3.1	.41	3.3	.53
April	67	22	0.7	1.76	5.0	1.69
May	81	30	- 2.0	3.20	T	3.49
June	89	37	1.7	2.56		2.08
July	99	45	- 2.2	1.99		3.18
August	96	43	- 0.9	1.04		2.66
September	95	31	1.5	2.56		2.74
October	77	24	0.5	.27		.10
November	68	-17	-10.7	1.44	16.5	1.72
December	45	-24	- 9.1	1.05	11.5	1.31
1978 Summary	99	-24	- 3.8	19.17	72.4	21.71
Mean	55.9	33.8		14.99	57.8	
Extremes	106	-43		23.73 (1909)	96.4 (1967)	

C. Land Acquisition

Nothing to report.

D. System Status

1. Objectives

Station objectives were revised and documented using the PPBE procedures in 1971. They have since undergone minor changes. We are anticipating a major revision/documentation effort in the near future. Table II shows the current outputs and objective level for this station's primary objectives. Excess water adversely affected this year's outputs.

TABLE II

REFUGE OUTPUTS

Output	Current Level	Objective Level	Units
Waterfowl Production	8,000	20,000	Each
Waterfowl Maintenance	9,000,000	8,300,000	U.D.
Other Migratory Bird Maintenance	3,500,000	10,500,000	U.D.
Environmental Education	2,500	5,100	A.H.
Recreation-Wildlife Consumptive	7,200	18,000	A.H.
Recreation-Wildlife Non-Consumptive	3,000	14,000	A.H.

2. Funding

TABLE III

FUNDING AND MANPOWER SUMMARY

FY	1100	1210[1]	1240[2]	3110[3]	Rehab	BLHP	Total	Manpower
79		132,000	6,000	5,000		65,000	208,000	4 PFT-1 T
78[4]		115,000	6,000	5,500	12,000	19,600	158,100	4 PFT-2 T
77		100,000	6,000	4,500			110,500	3 PFT-1 PPT
76		79,000	6,000	5,000			90,000	3 PFT-1 PPT
75	300	72,200	9,000	3,700	13,000		98,200	3 PFT-1 WAE

1 - Includes 1200 and 1220
2 - Includes 1500
3 - Includes 3100 and 3200
4 - 1978 special funding included WPA fencing (rehab) and dike repair materials (BLHP)

II. CONSTRUCTION AND MAINTENANCE

A. Construction

The final repair work to refuge dikes damaged by the 1975 flood was completed in September. A BLHP project provided $19,600 for this work. Previous funding was provided through the Flood Control Act of 1950. This year's project consisted of placing 1500 tons of sandstone rock along the face of Pool 3 dike and 1100 tons of three-quarter inch road surfacing material on the dike road between Pools 4 and 6. Refuge personnel and equipment made final placement of these materials.

High water levels and high winds caused an emergency situation in April. The exposed midsection of Unit 4 dike started eroding away badly. This section was scheduled for protective rip rap

Unit 4 dike being washed by waves.
Note the narrowing of the dike.
04/01/78 LV

under the BLHP project in August. An emergency purchase order was issued by the Area Manager and 1450 cubic yards of sandstone rip rap was used to protect Unit 4 dike as well as a badly eroding section of dike 49E. The $10,000 for this purchase came from this station's water pumping budget.

Equipment purchased this year included a ten foot Brillion seed drill and a 1979 4x4 Dodge pickup which was received in January, 1979. A 1964 Chevrolet carryall was transferred to the Bureau of Indian Affairs.

Maintenanceman Vince Marko moving the sandstone rock onto the windward face of the Unit 4 dike.
04/78 LV

Sandstone slab rock being applied to the eroded face of the Unit 2 dike.
04/78 LV

B. Maintenance

1. Fences

Several short sections of interior fences were removed to reduce flight hazards to waterfowl near water areas. Adjacent farming operations caused minor damage to refuge boundary fences at three locations. Landowners were contacted and requested to make the necessary repairs. The results weren't all that good - some of it had to be redone by refuge personnel. A short fence was built to control motor vehicle access near the east end of the 5/6 dike.

2. Roads

Considerable road damage occurred from spring runoff - generally a washing away of the gravel surfacing materials. Heavy trucks

Gravel was washed from this 200 foot section of refuge road west of Unit 4 when inflows exceeded culvert capacity in late March.
03/23/78 LV

hauling rip rap and road gravel also caused major chuck holes to develop in soft road beds and dikes. The worst of these areas were spot treated with 141 tons of gravel but will require further repairs and added materials. We experienced problems this spring getting road culverts opened and keeping them from replugging. Public access was restricted to a loop road around Unit 5 most of the summer due to high water level problems. A heavy stand of Kochia developed on back roads south of the main lake and required extra maintenance effort prior to the hunting season. All culverts were cleaned out and some outlets marked this fall.

Snow removal work started on November 12th this year. Heavy snowfall and strong winds caused considerable problems with snow removal in most rural areas. County and refuge roads were closed on several occasions in December.

Winter beauty. Several new weather records were set this year. As the year closed we were experiencing more road closures from drifting snow than ever recalled by locals.
02/78 LV

The refuge road grader, a 1946 Cat-12, and D-6 straight bladed push cat were inadequate to handle the job. Arrangements were made to borrow a D-7 with angle dozer from the C. M. Russell Wildlife Range for the winter.

3. Dikes

Muskrat tunneling damage was repaired on Unit 2 dike and along the 5/6 dike. Remaining dike work was covered under the section on construction. The 4A dike was severely damaged by high water again this year. Unit 1's secondary spillway was enlarged and given a rock core base for road crossing to reduce the dike overflow hazard and improve vehicle access.

4. Weed Control

The 1977 Kochia weed crop provided good food and cover for our local pheasant population. Ducks were also observed using the fence line accumulations. This fall we removed the scattered accumulations along the entrance road. To help with local public relations we removed and burned "our" weeds from one-half mile of a down-wind neighbor's shelterbelt.

No chemical control of weeds was necessary this year. Mechanical control was used to keep the refuge headquarters area trim. Our maintenanceman has a Montana applicator's license for herbicide use on pastures and rights-of-way. A few scattered patches of Canadian thistle were noted along the Lake Creek canal. A small patch of Russian knapweed was found in the county right-of-way near the Muddy Creek pumpsite.

5. Buildings and Grounds

The office building furnace system failed twice during winter weather and required a new circulating pump, fluid replacement and pressure control adjustments. The assistant manager is credited with preventing considerable damage from frozen plumbing as the furnace failed on a weekend.

Maintenanceman Marko constructed a security vault in the refuge office to hold the imprest fund and other valuable items. The exterior of headquarters buildings received a much needed coat of white paint. Refuge personnel made regular weekly runs to town for domestic water and hauled garbage to the city dump.

Both refuge residences were provided with a wood burning heat stove in the basement and two room humidifiers were purchased. Quarters 82 required a new hot water heater. Three outside doors and one interior door were replaced in Quarters 81 to improve security and reduce heat loss.

Years of accumulated miscellaneous property and supplies were sorted through and several truck loads were disposed of; to the county dump, Montana State Surplus Property Agency, excess ADC supplies to ADC and scrap sorted for future GSA sales.

6. Equipment

Most of the motor vehicles received two tuneups and servicing this year along with winterization and some steam cleaning. Two cracked windshields were replaced as a safety measure.

The main equipment repairs this year are as follows:

Cat-12 (1946) - Clutch brake - twice, transmission output shaft bearings, hydraulic brake lines. This unit needs major transmission repairs and should have been replaced under the BLHP program.

1971 4x4 Chevrolet - Replaced clutch, rear axles, alternator and repaired transfer case linkage. This unit is about to fall apart but isn't scheduled for replacement for a couple of years.

Airboat - A problem with pitting damage to the propeller was solved - prop was sucking gravel and miscellaneous debris out of the inside of the boat. We had just resolved this problem when the engine cowling mounts crystalized and the cowling was drawn into the propeller causing major damage - prop, exhaust, cowling and fibreglass structure. We were lucky no one was hit by flying debris. Repairs were made and the unit was used in the botulism control operations.

7. Canals and Structures

This spring Kloppel and Purdum Coulee water control structures were in a deteriorated condition and in danger of being washed out. Merle Hirsch, manager at Freezeout Wildlife Management Area, agreed to make temporary repairs. These two small structures permit turning some irrigation runoff into their water units. The structures are owned by the Service.

Lake Creek was inspected in July for flood damage and noxious weeds. Two 60 foot twin culvert structures had apparently plugged during runoff and were washed out. Repairs were completed by equipment rental in October. Kochia weeds were cleaned from Lake Creek structures this fall but high winds in November negated this effort. Access in the spring is almost impossible due to wet clay soils.

A landowner requested the widening of one of the farm crossings on his property. I had no budget to cover the request and suggested he work out a fence modification with his neighbor as the 66 foot structure was astride their common boundary.

Large culverts under the access road to our Muddy Creek pumpsite sustained flood damage and 200 cubic yards of rip rap was purchased to make repairs.

III. HABITAT MANAGEMENT

A. Cropland

Refuge personnel cultivated and replanted DNC Unit 3 to a tall wheatgrass (10 pounds/acre) and legume (2 pounds/acre) mixture in May after several weather and equipment caused delays. The legumes appear to have germinated and are becoming established. The grass seed hasn't shown much response but is expected to do so by next fall. The new Brillion drill was used.

DNC Units 1, 2 and 4 looked real poor in 1977; reworking and replanting were being considered. This year, with above average moisture conditions, these units really responded and will be in good shape this next spring.

DNC Unit 4 showing excellent growth after lying dormant through the 1976-77 drought. Photo taken from southwest corner of DNC looking east.
08/78 LV

This refuge contains 619 acres in seven field units which have been converted to DNC cover. Most of this was formerly in cereal grain crops. These plantings have proven quite successful for duck production and we feel they should produce 1 to 1.5 nests per acre with 80% nesting success over the long haul. This

translates into 3000 to 4500 ducks produced per year which is a significant portion of our refuge duck production objective. The questions remains, can we afford to plow up native sod in order to produce more ducks? Native grasslands generally produce about 0.15 nests per acre in this area.

B. Grasslands

Excellent moisture conditions from the record snowfalls and continued above normal precipitation throughout the growing season helped produce excellent grass stands on the refuge this year. Even so, this short grass prairie has a long way to go to compare with nesting cover produced by DNC units.

Field data on grassland evaluations are available in the "Grassland Management Report" submitted by this station.

The Muddy Creek tract was not grazed by the permittee this year. Range Specialist Joe Wirak of the Soil Conservation Service helped conduct a range survey of this tract in October. This pasture was rated at 30%, or fair, and SCS recommends at least two more years of non use. The problem is complicated in that there is no water on the BLM tract and no division fence. Verbal commitments were made when this tract was acquired to allow grazing. We will attempt to reduce grazing pressures on this tract. Even after a good growing season, without livestock grazing, SCS recommends a stocking rate of 30 AUM per season on this 250 acre tract (147 acres FWS, 103 acres BLM).

C. Wetlands

Water management plans for 1978 were to shallow flood all units in early spring. Units 1, 2, 4 and 5 would then be maintained through the brood period while drying Units 3 and 6 prior to early August when botulism is a hazard. Shallow flooding would then be utilized again in the fall to support fall migrants and the waterfowl hunting program.

These plans were rapidly amended as record runoff was received in late March. We started the year with about 2950 acre feet of water or 21% of design capacity. By May 10th we had 19,340 acre feet or 137% of design capacity. If no further inflows had been received we would normally have lost about two vertical feet of water (net loss) over our 5800 acre marsh unit by evapo-transpiration. This would have left us with about 7500 acre feet of water. At freezeup we still had 11,700 acre feet (83% of design capacity). High winds and relatively mild temperatures through October helped with evaporation losses. We estimate we received 16,390 acre feet of water in the initial runoff in late March and early April and up to 2800 acre feet of inflows through the rest of the season. This is based on six inches above normal annual rainfall and six inches less evaporation.

Several runoff basins east of the Bootlegger Trail held water through the brooding period and successfully brought off waterfowl, as did the two small stock ponds at the extreme southeast boundary of the refuge.

The four lower units were allowed to equalize in April when the last hope of individual unit management was lost. These units dropped from about 140% to 94% of design capacity by the end of the year.

In early June Unit 1 water level was lowered to reduce the chance of additional runoff flushing oil debris into Unit 2 through the spillway. It was further lowered in late July to let direct sunlight and drying winds work on the remaining oil debris left behind in the canal and upper corner of the marsh. The expanse of mud flats proved quite attractive to shorebirds all summer and fall.

Unit 2 water levels were lowered in late October and early November by gravity flows into the lower units (3-6) to reduce ice and flood damage potentials next spring.

At freezeup in early November refuge impoundments were at 83% of design capacity and had an additional 2390 acre feet of storage capacity. Without drainage capability this unit has little water level management flexibility, especially during high water years.

Vegetative Response

Units 1 and 2 took a thorough scouring by the excess flood waters causing physical damage and displacement of submerged aquatics. Emergents, principally cattail, held their own in Unit 1 and increased surface distribution and density in Unit 2. Unit 2 was also noted for its lack of mat forming algae blooms in late summer.

Unit 3 - Submerged aquatics showed good development with sago pondweed and water milfoil developing beds covering an estimated 30% of the surface area. Alisma and sour doct were also seen. Emergents - cattail - showed some development around the shoreline margin, but constituted only about 1% of the surface area.

Unit 4 - Submerged beds of sago pondweed were superb. Water milfoil was also well distributed. A large bed of Alisma covered a large central area near the west shore. Emergents - Good development and distribution of cattail in shallow areas with up to 40% of shoreline areas covered in the west bay, only a small percent of surface was covered. Spikerush made an equally good showing in moderately shallow and protected areas in the northwest quarter of the unit below Unit 2 dike.

Unit 5 - This unit was least affected by the spring floods with little or no change noted in submergent or emergent vegetation. This unit has very little emergent vegetation but strong development of submergents, mainly water milfoil and sago pondweed. We feel the former is increasing its dominance over the more desirable sago.

Unit 6 - This unit showed the most visual change. Past management using a regime of shallow flooding in spring and fall with a short dry period in mid to late summer had stimulated the establishment of spikerush. This year the unit held water all year and the spikerush dominated up to 80% of the unit's surface area. High wind action this fall laid over some of this emergent cover giving a slightly more open appearance to the unit. Duck brood use was notably higher in this unit.

Spikerush beds were prevalent in Unit 6 (lower left). Note the lack of emergents on the other large pools.
09/22/78 LV

D. Forest Lands

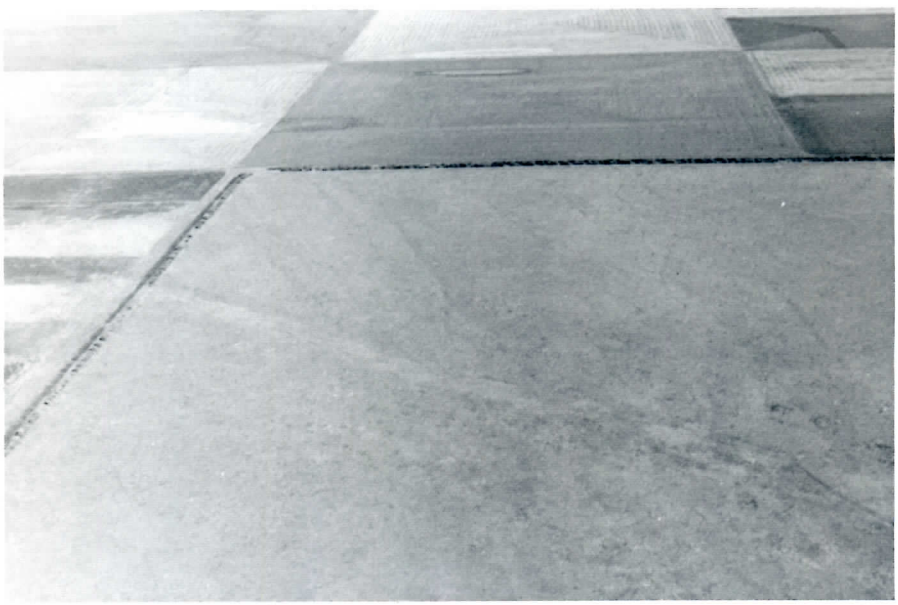
Not applicable.

E. Other Habitiat

Not applicable.

F. Special Areas

The Mullan Trail National Historic Site was located and photographed from the air this year. Additional photographs were reviewed at the SCS office in Great Falls. Mr. Joe Wirak, Range Specialist for the SCS, has obtained photographic evidence from 1937 aerial photos showing the trail locations from Fort Benton to near Vaughn. The trail, from Fort Benton, Montana, to Walla Walla, Washington, crossed the usually dry Benton Lake basin from east to southwest. Extensive farming in this area leaves little of the trail unplowed. We have ordered a copy of the 1937 aerial photos covering that portion crossing the refuge.



The Historic Mullan Trail. This photo shows where the faint wagon tracks enter the corner of the refuge (upper left), and head diagonally toward the lake basin. Note water drainage which enters on the left below the corner and crosses the wagon trail.
09/22/78 RLP

Mullan Trail Natural Area

The refuge files are somewhat unclear on the specific boundary of this designated area. Aerial photographs used in a SCS Conservation Plan showed two acreage units which total the exact acreage of the designated unit. The unit has had no cattle grazing since

1961, but has a few acres which have been encroached upon by windbreaks, hunter parking lot, the refuge ware yard and an inactive landfill. The 1976 fertilizer test plots are also located within this site. Power Poles also

G. Easements for Waterfowl Management

See attached report on Wetland Management District.

IV. WILDLIFE

Information on all wildlife categories was determined from minimal census data. Wildlife observations were taken incidental to other activities. Breeding pair counts were taken from the ground on all water units and two aerial brood counts were taken. One aerial waterfowl census was taken during the fall migration.

Nest searches were conducted on about 460 acres using the cable-chain drag device. Goose nest searches were made on all impoundments with the aid of an airboat.

A. Endangered Species

The American peregrine falcon and the bald eagle were the only endangered species recorded here this year. One adult male peregrine falcon was observed on May 9th along the refuge entrance road. The bird was seen only once. Several bald eagles were present during the spring breakup in March. They remained for a week or two before continuing their migration. Fall use by bald eagles was exceptional for Benton Lake, with 6 immature bald eagles observed on October 29th.

B. Migratory Birds

1. Waterfowl

Spring migrants began arriving on March 10. Several Canada geese were seen roosting on the ice a week or two prior to breakup. By the 19th the weather had warmed and over a thousand pintails and mallards were on hand. The race was on, and before long waterfowl were spread across the countryside like the spring runoff.

Breeding pair counts tallied about 30% fewer pairs than the past nine year average.

Duck production was estimated at 7930 birds. A full report on 1978 duck production is in the refuge files under "Waterfowl Production". Nest searches were also conducted, the results of which are found in the "1978 Nest Survey Report".

Waterfowl use days were up slightly from last year. Water was readily available in all wetlands around the refuge this spring. This situation diluted our normal number of spring migrants. Ducks began filtering into Benton Lake during the summer and swelled populations to around 30,000. By fall many of the surrounding wetlands were dry and a large number of migrating pintails took up temporary residence here.

On August 8th a small outbreak of botulism was located in Pool 4 and confirmed by the National Fish and Wildlife Health Lab in Wisconsin. Pick up operations began immediately but were hampered just as quickly when the engine cowling broke on our airboat. Pick up operations resumed after borrowing an airboat from the State Fish and Game Department at Freezeout Wildlife Management Area. A private airboat was located and rented and cleanup continued into August and September.

A major outbreak of botulism near Billings on Broadview Marsh drew attention statewide and was responded to by several refuges and others. A two man crew with airboat was sent from Benton Lake to the Broadview Marsh on four different occasions.

On opening weekend of the waterfowl hunting season at Benton Lake (September 30), several hunters brought in ducks which are suspected as having died of botulism; our cleanup crew was still helping mop up at Broadview. Table IV below summarizes the botulism losses which have been recorded at Benton Lake.

TABLE IV

BOTULISM LOSSES AT BENTON LAKE

	Pool 1	Pool 2	Pool 3	Pool 4	Pool 5	Pool 6	Total
1970	603	1,365	5,107	9,098	3,405	1,841	21,419
1971		927	6,295	2,212	2,627		12,061
1972	34	45	402		2,964	6,760	10,205
1973			1,665		95		1,760
1974			986				986
1978*	65	2	24	719			810
Total	702	2,339	14,479	12,029	9,091	8,601	47,241

*No botulism losses were recorded in either 1975 or 1976. A scattering of badly decomposed duck carcasses were noticed in the fall of 1977 - cause of death was suspected as botulism.

In late April all pools were checked for Canada goose nesting activity. Results were encouraging with eleven nests found containing over 50 eggs. The round straw bales which were placed in Pool 6 as goose nesting structures were all but submerged under record water levels. One bale did harbor a goose nest, but most bales deteriorated rapidly under the constant wave action.

Islands and muskrat houses in Pools 4 and 2 were the most commonly used nesting sites. Two nest baskets in Pool 2 were also used, one holding eleven eggs! These baskets were filled with old cattail duff last fall. Because the nests were not revisited, nest success was not determined, but at least six broods were seen in early summer. The most broods observed in a single day was four broods with 22 young seen on May 26th.

Known mortality included two or more goose broods which were victims of the oil spill in Pool 1. In addition, two young and one adult were found dead along the tour route dike. They appeared to have been hit by a car. On July 11th an aerial brood count revealed only three goose broods with 17 young. Undoubtedly, all broods were not sighted because of heavy emergent cover, but it appeared that young geese suffered higher than usual mortality. Production was estimated at 25 birds or about half of last year's figure.

Whistling swan visited the refuge in early spring and late fall. One immature whistling swan with an injured wing stayed all summer at Benton Lake. It was captured during botulism cleanup and donated to Gibson Park in Great Falls where it is doing well. Use days did not approach those of last year. Some swans and snow geese arrived at Benton Lake just prior to freezeup this fall, and the weather changed so quickly and severely that all waterfowl deserted in a matter of a couple of days. Snow goose family counts were not conducted this year.

2. Marsh and Water Birds

Coot populations remained near normal this year. Many young were found dead in their nests during the botulism cleanup. They were assumed to be botulism victims, but no coot specimens were sent to the Health Lab. Fall populations were higher with 38,000 present in late September.

Double-crested cormorants were slightly more plentiful this year. Nearly one hundred were seen in late June on Pool 4. One pair actually nested and raised two young on an island in Pool 4. They appeared to be sustaining themselves on frogs and salamanders. This is thought to be the first recorded nesting of this species on Benton Lake NWR.

Several eared grebe colonies were found in Pools 3, 4, 5 and 6. In one instance a California gull was observed in a colony hopping from nest to nest and pecking. It is possible that these nests provide a buffer to gull predation on waterfowl nests, since the grebe nests are so much easier to locate. Over 200 eared grebes were found dead in Pools 1 and 2 on July 19th. Lab analysis could not identify the cause of death. All but 7 of the grebes were young birds.

3. Shorebirds, Gulls and Terns

Our records show positive evidence of reproduction in the following species this year:

Upland Sandpiper	Marbled Godwit
Willet	Wilson's Pharlarope
American Avocet	Killdeer
Common Tern	Black Tern
California Gull	Franklin's Gull

California gulls nested along the dikes dividing Pools 3 and 4. A high count of 65 nests contained over 150 eggs. After the young began emerging many nests contained dead meadow voles and mice. Ducks were known to have nests nearby along the dikes, but no direct evidence of gull predation was observed.

California gull with nest on Unit 3 dike.
Note leg band and pipping egg.
06/78 LV

Two chicks at sea. The California gull colony nests along the central portions of the Unit 3 and 4 dikes.
06/78 LV

Franklin's gulls nested by the hundreds in the dense cattail stand in Pools 1 and 2. During the summer several dead Franklin's gulls were picked up along dikes. Some were sent to the Health Lab for analysis, but the Lab could not explain the deaths.

4. Raptors

Snowy owls were present all winter and into March. As many as three snowys and one great horned owl worked the refuge shelterbelts and preyed upon the Hungarian partridge. Snowy owls returned to Benton Lake in December.

Rough-legged hawks were present all winter with as many as twelve seen on one day in March. Several burrowing owls were seen this spring and one pair stayed the summer in the area of the old Benton Lake drain. It is not known whether or not they raised any young.

The usual number of prairie falcon sightings were made. One to two falcons frequented the refuge all year. Short eared owls were not seen as often this year but were present most of the year.

5. Other Migrating ~~ing~~ ery Birds

Nothing to report.

Short-eared owl.
05/78 LV

C. Mammals, Non-Migratory Birds and Others

1. Game Mammals

Two buck white-tail deer were seen along the east end of Pool 5 in September. Two sightings of single mule deer were also recorded. These are the only records of big game seen this year.

2. Other Mammals

Whitetail jackrabbits began congregating in the headquarters shelterbelts this winter. Evidence of heavy damage to the trees was noticed, and we began a control program to protect the windbreaks. Some 80 jacks were dispatched in the immediate vicinity of headquarters. In November jackrabbits were beginning to group up again, and about 35 were disposed of.

In March, with a heavy snow cover on the ground, the first Richardson's ground squirrel emerged. He apparently didn't see his shadow because several days later spring thaws were eradicating the snow banks.

Manager Pearson examines rabbit damage which was quite extensive on this private hedgerow. Acquisition Office Photo 06/78 BL

A muskrat house count was taken during the winter on foot. Only 16 houses were found in Pool 1 and 2.

Mink, though not commonly recorded here, were seen several times this spring.

3. Resident Birds

Ring-necked pheasants are not abundant here. About a dozen birds were seen in early spring and some broods evidently were raised. By December we recorded about 30 in the headquarters shelterbelt. This is the highest number of pheasants seen since the refuge was manned in 1961.

Hungarian partridge left from the winter reproduced well, but their numbers did not reach those of last year. Nevertheless, there were about 100 birds around headquarters going into fall. No count was taken.

Several sightings of sharptail grouse were recorded during the year, but they were mostly single birds.

A winter covey of Hungarian partridge taking advantage of refuge shelterbelts.
03/78 LV

4. Other Animal Life

Rattlesnakes are common near the southeast corner of the refuge. Although fewer were seen this year, two were found west of the Bootlegger Trail, where few previous reports are known.

Prairie rattlesnake (Crotelus viridus) caught napping on a warm rock.
06/78 LV

V. INTERPRETATION AND RECREATION

A. Information and Interpretation

1. On Refuge

Due to high pool levels and spillways under water, refuge visitors could not really get around well until June. The refuge received 1055 environmental education visits in May from the Great Falls School System.

No auto tours were conducted this year.

2. Off Refuge

Refuge Manager Bob Pearson gave slide talks to two local groups, and addressed the Montana Fish and Game District IV meeting with Realty Specialist Ben Lukes on the wetland acquisition program.

B. Recreation

1. Wildlife Oriented

This year 2050 hunters spent 7175 activity hours to bag 9470 ducks and 50 geese. Mallard, gadwall, pintail and shovelers were the most common ducks in the bag while Ross' geese and Canada geese made up the bulk of the goose harvest.

More acres were open to hunting this year. Pools 1 and 2 were closed. Without the firing line in Pool 2 the hunters spread out well and did much better than last year. All eleven portable blinds were put out and most were used successfully. Those that were not used were taken over by muskrats which built large cattail mounds on them.

Only 4,038 visits were received this year (discounting hunters). The decrease may be due in part to the high water this spring and the many rains which made roads too messy to drive on. On several occasions the visitor road was closed to prevent road damage.

2. Non-Wildlife Oriented

Nothing to report.

C. Enforcement

Only 14 violations were processed this year. The most common violation continues to be hunting in closed areas. Snipe hunting was closed on the refuge this year, and we only found six dowitchers which had been shot. Swan shooting continues to be a problem. Two dead swans were found this year.

VI. OTHER ITEMS

A. Field Investigations

1. Nesting Studies

The current nest study objective is to quantify nest densities on various cover types. Sites are searched only once during the peak of the nesting season. All hens flushed are counted as nests, but the nests are not actually visited on foot. Wildlife other than waterfowl is recorded whenever conditions permit.

The results of the 1978 nest search are found in a separate report entitled "Calendar Year 1978 Nest Study Report".

2. Native Grassland Evaluation Program

The major native grassland types are monitored annually with spring and summer Robel readings on seven permanent study plots and on fertilization test plots.

Abundant precipitation and a relatively cool growing season resulted in excellent forage production. Complete results of the grassland study are found in the "Grassland Evaluation Report for 1978".

3. Saline Seep and Related Problems

We are concerned with the long term outlook for Benton Lake. The following polution sources are identified:

a. Surface salts and agricultural chemicals flushed into the lake from natural runoff.

b. Highly concentrated discharges from tiled saline seep areas on private lands into Lake Creek. Some readings indicate 60,000 micromohs conductivity or more. Two or three tiled systems exist and more are planned for 1979.

c. Existing saline seeps on refuge lands. The recharge areas are on private lands up slope from the refuge. Corrective measures would call for changing from a fallow cropping system to annual cropping, along with the planting of a deep rooted cover crop on the recharge area such as alfalfa which has a high rate of water consumption.

d. Water Source - Irrigation district return flows to Muddy Creek.

The historic drainage out of Benton Lake lies about twenty feet above the lake bed. Outflows haven't occurred in recent times. We are interested in getting a graduate study project going on this problem.

B. Cooperative Programs

1. Right-of-Way Administration

a. Montana Power Company

This powerful utility company serves most of the State of Montana. Last year they installed a new 12 inch natural gas line just east of the refuge. This year they began salvaging the old 1930 telstad line that traverses the east quarter of the refuge, claiming a very high salvage value. They also had to obtain new service connections to the new line that would entail crossing the refuge. During the environmental assessment stage we countered their proposal with what appeared to be a logical route with minimum impacts to the refuge. We also stated we would have to see their right-of-way document covering the old telstad line so as to determine what the conditions of abandonment might be before we would allow removal operations to proceed on the refuge. They finally changed their story from "the documents had been burned in a fire in Butte", to admitting the original company had apparently built the line without a permit across government lands.

Removal of this old line would have had many negative impacts including a 40 to 80 foot sodless strip across the entire east side of the refuge; it traversed the edge of Impoundment 5 in two locations and crossed under DNC Unit 7. The three and one-half mile strip would take many years to resod and is adjacent to the paved county road. After the 48 years or so that this pipeline has been buried, there still remains visual differences in surface vegetation.

We are pleased to report that in early August the company agreed to our terms - that of leaving the old line in place and just sealing it off at each end where it leaves the refuge. They also agreed to our proposed service line right-of-way location which involved burial (plowing in) of a two inch plastic line along the county road right-of-way for one-half mile from the south boundary. We were able to establish a good rapport with the company's recently hired environmental specialist, Dennis Schwehr, and with his support obtained the above settlement.

We had on-going battles most of the year with various other segments or representatives of the Montana Power Company - from frequent vehicle trespass to fence cutting. Many warnings were given but no citations were issued. Their service line was connected in December. The old telstad line salvage operation was stopped a couple of of miles from the refuge by weather.

b. Mountain Bell Telephone

While investigating refuge records for right-of-way documents on the telstad line, we found that the refuge also had no document on the county road or the telephone buried cable. We got a copy of the Highway Department's right-of-way document and it specified it was for the purpose of construction and maintenance of a highway only. The very next day we received a phone call from a Montana Power Company official who claimed they didn't need a right-of-way for their service line from us as the county road constituted a utility right-of-way. They had previously tried to justify the old telstad line as following the old county roadbed, which it didn't.

The Mountain Bell Telephone Company has been requested to make application for their cable and was given the pertinent application instructions. They plan a field survey this spring to support their application.

c. Montana Fish and Game Department

Department personnel provided law enforcement assistance during our waterfowl hunting program. An airboat was borrowed from Freezeout Lake WMA for a couple of weeks during our initial botulism outbreak at Benton Lake. Freezeout personnel and equipment made temporary repairs to two service water control structures in June. The initial report of the oil spill on Lake Creek also was relayed by Department personnel. We at Benton Lake NWR appreciate all of the support and assistance given by the Department. We were able to reciprocate in a small way by lending them our Zon gun exploder on several occasions for use in deer and elk damage control.

d. FWS Programs

April - Investigated an oil spill on Two Medicine Creek from the Tiber Reservoir up the Marias then up the creek to the oil spill site by airplane. One pair of Canada geese appeared to be affected by the crude oil. Several hundred ducks and about 50 geese were seen. The Cut Bank area oil fields showed many signs of previous oil spills along the canyon rims.

Surplus property items were obtained for the Bison Range and the National Elk Refuge from Malmstrom Air Force Base.

August/September - Refuge personnel and equipment helped with botulism cleanup operations at Broadview and Big Lake (private marshes near Billings, Montana) on four separate occasions.

We coordinated and developed a reac... to a request for an environmental ass... adio tower being built by a local

We have worked cl... ecialist all year on wetlands evalu... ublic relations and it has been mu... her year-round association has be... t stationed in Great Falls.

e. Oh! Blissful Ignorance

On November 6, 1978, we were given a minor jolt when we found out that the local fighter division of the Montana Air National Guard has been using Benton Lake NWR as a designated emergency jettison area for auxiliary fuel tanks and live armament, i.e., air to air and air to ground missiles since the late 1950's. This came to light when the Malmstrom Air Force Base operations officer sent us a request to use the refuge for the same purpose on a secondary basis.

We can now breathe easier (I think) as both military agencies agreed and have found and designated a new site for such purposes south of Great Falls. Apparently Department of Defense regulations don't require the military agencies to even inform the landowners, private or governmental, of such a designation.

C. Items of Interest

1. Staff Happenings

Vincent J. Marko, refuge maintenanceman, received a permanent full time appointment effective June 4, 1978. He first began work at this refuge on April 30, 1962, and worked under various temporary appointments until 1976 when he received permanent part-time status. Mr. Marko is a very talented and conscientious employee and carries the brunt of our maintenance program.

Larry Veikley, assistant refuge manager, was called upon to help hold up our maintenance program by using his knowledge and skill

in equipment operation and maintenance. He also provided the refuge office with a beautifully mounted great horned owl using his taxidermy skill. He was promoted to GS-9 on July 17, 1978.

Elizabeth "Betty" Benway, administrative clerk at this refuge since July 24, 1968, was presented with her ten year pin by the manager. Betty did an outstanding job of engineering retirement and going away parties this year. She also deserves the red badge of courage for responding well under heavy work load pressures at various times during the year.

Eugene E. Cofer, Special Agent, Law Enforcement, Great Falls, Montana, turned in his badge officially on September 30, 1978. His position has been refilled by Mr. Rod Hanlon who transferred in from the state of New York. Betty was the organizing force behind Gene's retirement party, which drew friends from all over the west and was quite an event.

Benjamin M. Lukes, Realty Specialist, has worked out of this refuge office since 1971 appraising and buying duck habitat for fish, fur and feathers. He decided to take a look over the USFS fence; he briefly joined the Smokey Bear crowd. Betty again dutifully did her "thing" with a going away party for the Lukes family in November. Ben was back with "us ducks" in less than a week - he didn't like the "pitch" in the trees. Welcome back, Ben!

2. Training

Pearson

01/29 - 02/28	- Enforcement Training at Glynco, Georgia
02/14-15	- Project Leaders Workshop at Billings
04/25-28	- Prairie Fire Burning Workshop at Jamestown, ND
05/09-11	- Performance Standards & Personnel Mgmt at Billings
08/29 - 09/01	- Environmental Education Workshop at Keystone, CO
09/18-21	- Biological Workshop at Billings
11/28-29	- ZBB Workshop at Billings

Benway

07/10-12	- Timekeepers Workshop at Billings

Veikley

01/26-27	- Montana Chapter Wildlife Society - Telemetry at Lewistown
02/14-15	- Project Leaders Workshop at Billings
June	- Wetland Management Workshop at Malta
09/18-21	- Biological Workshop at Billings
11/28-29	- ZBB Workshop at Billings
12/04-08	- ZBB Area Compilation at Billings

3. Pollution Problem

This report documents the basic details of the oil spill which occurred on June 1, 1978. The Phillips Petroleum Company's pipeline from their gas and oil fields near Cut Bank, Montana, to their refinery at Great Falls developed a small leak prior to June 1 which was apparently caused by corrosion. The problem developed in the SW¼ of section 33, T. 23 N., R. 2 E. This is where their pipeline crosses a tributary channel to Lake Creek.

The source of the oil spill. Phillips Petroleum pipeline crosses Lake Creek about five miles west of Benton Lake.
06/02/78 RLP

Rainfall on May 30 and 31 generated surface runoff into Lake Creek and flushed the accumulated crude oil down the creek to Benton Lake Refuge on June 1, 1978.

Lake Creek is the main water conveyance to Benton Lake National Wildlife Refuge. The refuge was established in 1929 for the primary purpose of waterfowl production. There are 5600 surface acres of water habitat. This habitat produces 10,000 to 20,000 ducks annually along with many thousands of other birds such as the eared grebe and Franklin's gull. At least 162 different kinds of birds use Benton Lake Refuge and 56 of these nest here. Spring and fall migrational peaks exceed 50,000 birds. Needless to say, oil spills from this pipeline could have catastrophic effects on these birds.

On June 1, 1978, a Teton County road crew observed the oil in Lake Creek and called the Montana Fish and Game Department. They contacted me and suggested that it was probably coming from the Phillips Petroleum Company's pipeline. I alerted their Great Falls refinery and they referred me to the Cut Bank office at 1:30 PM. No one was willing to accept responsibility untilthe source of the leak was determined.

I initiated containment procedures immediately by having filter fence structures placed at two water control structures in Lake Creek just west of the refuge.

Snow fence and straw helped filter out oil
at two control structures west of the refuge.
Attempts to burn the heavy oil proved ineffective.
06/01/78 LV

Phillips Petroleum Company called about 4:00 PM acknowledging responsibility for the spill. Their crews arrived from Cut Bank, Montana, about 6:30 PM and set up a skirted floating boom on Lake Creek at the Teton/Chouteau County lines just west of the refuge. Their helicopter crew got the pipeline leak sealed off and then flew over the spill area and reported to us that very little oil had escaped on down the channel below the two filter fences that the refuge had established. As a safety precaution I suggested we install one more skirted boom at the mouth of Lake Creek channel where it enters Unit I marsh. On inspection I found

Skirted floating boom structure installed across Lake Creek just west of the refuge by Phillips Petroleum Company.
06/02/78 RLP

considerable amounts of oil present and insisted that two structures be built to contain the oil to prevent it going on into the marsh. At this point there "appeared" to be no one in charge of Phillips Petroleum's field crew and the refuge crew did most of the work and Phillips provided the boom material for one structure.

During the following days of cleanup operations by Phillips Petroleum Company, there appeared to be an endless succession of delays in obtaining the necessary materials, trucks and crews. On the positive side, their field supervisor, Mr. "Tig" Deroscher was 100% cooperative and was very receptive to my suggestions on cleanup action needed.

Refuge personnel set up noise devices to disperse the birds away from the oil spill area and continued to monitor the marsh unit for spread of oil and to detect affected wildlife. Water levels were lowered to help contain the oil.

Wildlife losses were detected and treatment facilities were established. Total known losses were: muskrat - 2, Canada geese - 3, pied-billed grebe - 2, American coot - 1, ducks (mostly scaup and redhead) - 7, for a total known loss of 15 animals. The extensive

Floating boom placed by refuge personnel in upper Pool 1. Another snow fence filter was placed further downstream in the marsh.
06/02/78 RLP

Suction truck crew skimming off oil at a filter fence on the Richard Ewing property.
06/02/78 RLP

stands of cattail in the marsh unit and the secretive behavior of sick or injured birds made retrieval or accounting of losses impossible. There were at least 23 additional birds and one muskrat which were observed to be affected by the oil (coloration and behavior). Many nests in the oil spill area were lost, particularly the American coot, scaup and redhead, and numerous blackbird nests.

Some of the oil in Pool 1 marsh which was not contained. Diving ducks, goslings and muskrats were the most obviously affected.
06/02/78 RLP

Habitat damage is also hard to assess. We estimate 20 acres of marsh and channel and 5 acres of upland grasslands were adversely affected by this oil spill on Benton Lake National Wildlife Refuge.

In summary, the oil spill which Phillips Petroleum Company claims to have been only 20 to 35 barrels resulted in relatively minor damage compared to what it might have, considering the potential. The early and continuing efforts of the refuge did much to minimize total damages, whereas Phillips Petroleum Company was slow in responding to the emergency, came half prepared and had many problems

Oil sheen moving into open water on Pool 1. Very little wind during the cleanup period kept the spill from spreading over the entire marsh.
06/02/78 RLP

in obtaining adequate supplies, equipment and manpower to do an effective and efficient job.

D. SAFETY

Five safety meetings were held this year covering a wide spectrum of Safety subjects. Two Safety films were viewed, one on eye protection and one on office Safety.

There were no lost time accidents at Benton Lake this year. One accident report was filed when a summer employee contracted an infection while on botulism cleanup duty. Only brief medical attention was required.

Assistant Manager Veikley had a close call (off duty) with a lawn mower. While pushing the power mower over a roughly landscaped lawn he managed to get the top of his Lehigh boot under the deck and into the blade. The boot didn't fare too well, but the foot was uninjured. Thank heavens for those steel toes!

Protective eye gear was replaced this year, but the age old problem of how to keep face shields and goggles clean cropped up again. To solve this, Maintenanceman Marko constructed two small cabinets with plexiglass doors, each which now houses a face shield and other personal protective gear. They are located conveniently near the drill press and grinders.

Cabinet designed and constructed by Mr. Marko now keeps protective eye gear cleaner, yet is very handy to grinding operations.
03/79 LV

BENTON LAKE

WETLAND MANAGEMENT DISTRICT

Personnel are listed in the previous report.

Review and Approvals

Submitted by	Date	Area Office	Date
Benton Lake National Wildlife Refuge		Regional Office	Date

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I. GENERAL

A. Introduction

The Benton Lake Wetland Management District was established in 1975. Initial delineation was conducted in 1974-75 by Rod King. Acquisition began in 1974 by Realty Specialist Benjamin Lukes. A more active public relations program is needed if the program is to continue for very long. State legislation in Montana and South Dakota appears to be following the North Dakota lead.

B. Climatic and Habitat Conditions

Precipitation above normal throughout the district provided considerable improvement and recovery from the 1977 drought. Spring water levels and distribution in the district were the best in many years, if not at record levels.

C. Land Acquisition

1. Fee Title

Table I provides historic data on the nine WPA's acquired in this ten county district to date. Acquisition can be painstakingly slow at times and is affected by the national economy, political climate and the North Dakota "scene". Public relations are critical in proceeding with both the acquisition program and the initiation of the management and development programs.

TABLE I

FEE ACQUISITION BY COUNTY

County	1976 No.	1976 Acres	1977 No.	1977 Acres	1978 No.	1978 Acres	Total No.	Total Acres
Powell	1	300.0					1	300.0
Teton	1	251.5					1	251.5
Glacier			1	96.0			1	96.0
Toole	1	1675.0			5	1408.0	6	3083.0
Totals	3	2226.5	1	96.0	5	1408.0	9	3730.5
Total Wetland Acres		~~504.0~~ 339.0		27.0		315.0 237.0		~~846.0~~ 603

TABLE II

EASEMENT ACQUISITION BY COUNTY

County	1974		1975		1976		1977		1978		TOTAL	
	No.	Wet Acres	No.	Wet Acres	No.	Wet Acres	No.	Wet Acres	No.	Wet Acres	No.	Wet Acres
Glacier					21	881	14	443	9	459	44	1,783
Liberty	5	303	4	125							9	428
Pondera			7	601							7	601
Teton					1	50					1	50
Toole	9	1,145	17	852	4	134			2	53	32	2,184
TOTAL	14	1,488	28	1,578	26	1,065	14	443	11	512	93	5,046

Total acres under easement:

Glacier	20,526
Liberty	6,200
Pondera	8,335
Teton	800
Toole	26,943

2. Easements

This program appears to flow along with fewer conflicts or problems than the fee program. There is a somewhat active Water Bank program by the ASCS in the five counties in this district. We continue to seek mutual support and understanding with each other's programs in these counties. Table II provides historical data on easement acquisition within the district.

D. Systems Status

1. Objectives

Objectives are not yet formulated. We are searching for background information on duck nesting densities which can be expected on developed and protected WPA units. Waterfowl production rates are harder to forecast for our easement areas due to the higher variability in available nesting cover and brood habitat.

2. Funding

The first direct operational funding for the district was obtained in FY 79. In 1977 one position and support funds were designated in the refuge budget to be applied toward operating the district. This was a BLHP position. In 1978 revolving rehab funds were used to construct boundary fence on the Furnell WPA.

TABLE III

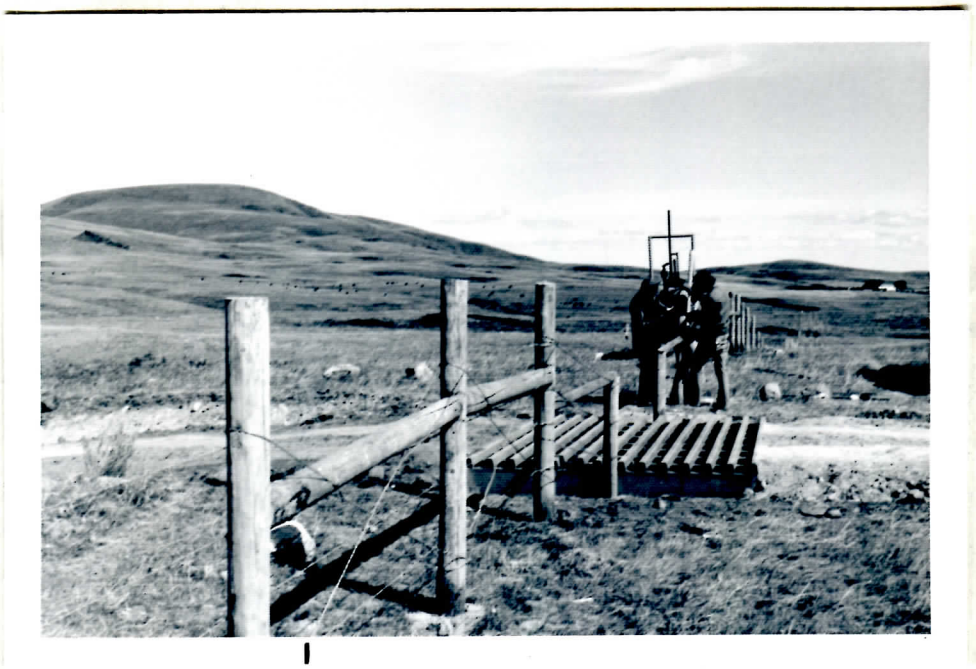
BENTON LAKE WETLAND
MANAGEMENT DISTRICT FUNDING

FY	1210	1240	BLHP	Rev. Rehab.
78				12,000
79	4,000		42,000	

II. CONSTRUCTION AND MAINTENANCE

A. Construction

Refuge employees built three miles of boundary fence and 1.5 miles of interior fence along the county road in the Furnell WPA near Whitlash, Montana. This remote and isolated work site required extra cost and planning effort. Wet weather and the death of one employee's family member also caused delays. This fencing provides control of open range cattle to the extent that refuge neighbors cooperate in keeping gates closed and not cutting fences.



Fencing crew tying in cattleguard in new boundary fence on Furnell WPA.
07/78 RLP

Toole County Commissioners would not approve the placement of a cattleguard across the county road. They are anxious to eliminate existing cattleguards where ever possible. Added fencing will be required because of this.

The Brumwell WPA was partially posted this fall to help hunters identify the unit. Acquisition is incomplete on this unit.

B. Maintenance

McCormick WPA - Fences were inspected in June after snow melt. Minor fence repairs were made following a forced entry and cattle trespass in late July.

McCormick WPA cattle trespass, Powell County. Notice how the wires have been unwrapped, dragged back and hung on another post.
07/26/78 LV

Furnell WPA - Minor fence repairs. The private access road was realigned and improved to reduce snow drifting and wet soil problems. Proposals were reviewed and approved by the refuge manager to protect wetland values, and all work was done by the neighboring rancher.

C. Wildfire

None.

III. HABITAT MANAGEMENT

A. Cropland

Furnell WPA - A cooperative farming agreement covering grain cropping and rock picking was in effect, but the cooperator failed both in rock picking, farming and ranching and went bankrupt.

A new operating partnership was formed and we drew up a new agreement for cereal grain farming on 26 acres. The large field requiring rock picking was left idle as no agreement was reached regarding it.

The barley crop was planted late and only produced a marginal crop; 25% was left standing as a wildlife food patch. Deer, sharptail grouse and Hungarian partridge used the crop. The rocky field developed a good stand of weedy cover with some grass such as timothy, western wheatgrass, slender wheatgrass and prairie Junegrass. SCS recommends fall burning and aerial seeding this field with Nordan wheatgrass, Ladak alfalfa and sweet clover.

Brumwell WPA - The cooperative farming agreement with former landowner Brumwell continued as drawn up. A review of field conditions with SCS indicated several small adjustments needed to treat saline seep areas. Cropping on some marginal areas such as steep slopes and excessively wet areas should be terminated. We are considering renegotiating this agreement to speed up conversion to DNC. No report was received to date of crop volume harvested under the agreement.

Ehli WPA - Tentative agreement has been reached on the Ehli and Danbrook Tracts to continue cereal grain farming by former operators. Local concern was expressed about "waterfowl factories" causing local crop depredation problems. We plan to retain some of the croplands in a winter wheat program and use these as needed to reduce depredation complaints. DNC will be developed on these croplands at a slower conversion rate than normally planned. Wind and sheet erosion need corrective treatment on these fields.

B. Grasslands

Grassland management on WPA units consisted of securing some degree of control over livestock grazing through the construction of boundary fences on the Furnell WPA and enforcing trespass regulations on the McCormick WPA. The negotiation for an important 320 acre inholding in the Furnell WPA (Aiken Tract) involved a land use reservation for the next five years which allows a fixed amount of cattle grazing from June to November. Additional fencing planned for FY 79 will allow us to rotate this grazing pressure between three pasture units. A fourth unit will exclude all cattle grazing. Grazing pressure on this 1995 acre WPA will be about one-third or less of what it has been receiving in recent years.

Range conditions were examined with Range Specialist Joe Wirak of the Soil Conservation Service in mid October. Range sites were identified and species composition, distribution and general condition were noted. Specific problems were noted and management recommendations made.

Range Use Notes

Furnell WPA (1995 acres) - This is a silty loam foothill site in the 15-19 inch rainfall zone. The overall range is rated at 35%. The northeast corner showed only about 25% utilization by livestock. The southwest quarter with steeper topography and more fragile soils appeared to be in the poorest condition. Cattle had excavated several pits in the northeast quadrant (Aiken).

This WPA and surrounding lands have been under intensive grazing pressure since settlement. There is some irrigated and dryland hay production, but the majority of the lands are managed for cattle pasture.

Special use permits were issued for the first time this year to cover the uncontrolled grazing use on this WPA. Boundary fencing closed the west boundary in early July. The Aiken cattle grazing problem was resolved in connection with negotiated acquisition previously mentioned. There are three gas wells on site, two producing and a new one drilled this year.

Ehli WPA (568 acres) - The site condition is judged to be 45 - 50% on the north side. Most acreage consists of marsh or cropland. A forty acre tract, having been in the Water Bank Program, has similar cover to our DNC plantings with a mixed cover of wheatgrasses and alfalfa.

There hasn't been any cattle grazing on this unit in the last few years, and it is our best waterfowl producing unit so far. There is one producing gas well in the adjacent field.

Danbrook WPA (160 acres) - There is little left here as far as natural grasslands. It consists of about 100 acres of cropland and 50 or so acres of lake. A farmstead and some alkali seeps account for the rest. There is one dry gas well present. Soil erosion and saline seeps are the biggest problem on this WPA.

Brumwell WPA (251 acres) - This unit is mostly marsh with some cropland, alkali seeps and a trace of native grassland at the north end. A railroad track crosses the west side. There are no grazing pressures.

Brumwell WPA, Teton County. Extensive beds of spikerush and other emergents show up as darker patches. Estimated 70 - 80% emergent cover.
07/11/78 LV

Peterson WPA (96 acres) - This unit has a good mix of croplands and wetland basins. Native grassland remains intact along the west property line in a 20 - 30 foot wide strip. There are no fences and no grazing pressures in the area. Oil and gas wells and a distribution line are on the tract and immediate area. Soil erosion is not a problem on this unit due to topography.

McCormick WPA (300 acres) - This unit was fenced in 1977. A range survey was not conducted on this unit. It has a history of heavy use. About 65 head of steers were removed from the unit in late July. The adjacent ranch operator denied any knowledge of the trespass by his stock, or how the fence got cut and the loose wires hung back on the fence. The absentee owner was given written notice and we don't anticipate further problems from that source. The Blackfoot River crosses the south portion of this WPA and presents some fencing problems. The section of fence near the site of the cattle trespass needs replacing but poses a challenge, because it crosses a Type IV marsh.

Portion of McCormick WPA, Powell County. Wetland pattern shown is typical of this area. Cattle trespass originated from the plowed field in the background.
07/11/78 LV

C. Wetlands

Water conditions were much improved with the drought of 1977 overcome. Good brood habitat was available throughout the year with good carry over for next year in all but the shallower seasonal wetlands.

No functional facilities exist on WPA's for water manipulation. There is potential for some on the Furnell and Ehli Tracts.

D. Forest Land

Only the McCormick WPA has any forest land which is streamside high mountain habitat along the Blackfoot River. Species composition has not been examined and only a very few acres are present.

E. Other Habitat

Not applicable.

F. Wilderness and Special Areas

Not applicable

G. Easements for Waterfowl Management

Easement Inspections

No easement inspection flight was made this fall. Waiting for the last possible week of good fall weather to fly easements is tricky at best, and the drastic weather change that occurred during early November prevented inspection.

One case which was pending from the 1977 inspection was settled in April. The case involed Tracts (33X) and (33X-1) which contained drainage ditches. There was no aerial photograph adequate to substantiate our case, so the tract file was amended to include drainage facility maps for these two ditches. Life goes on ....

A second possible violation was noticed from the ground on Tract (35X). It appears at this point that we are having a rerun of the (33X) case, but the landowner has not been contacted yet. This easement will be inspected on the ground this spring to determine if the ditches are functional. This development was called to our attention when the landowner contacted us to see if he could discontinue the easement agreement. It seems he was having some saline seep problems and had apparently been advised to drain the wetlands to alleviate the problem.

One easement in Glacier County (24X-1) was photographed during a brood count. The wetland was evidently used as a farm dump in past years. The trash was present when the easement was taken, but future dumping may be discernible using comparative photographs. Although unsightly, the trash helps prevent the small piece of upland nearby from being plowed under.

Easement (24X-1), Glacier County. This photo documents past use of this wetland as a dump site.
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IV. WILDLIFE

Little wildlife information was collected for the Wetland Management District. Total census consisted of two aerial brood counts and a partial aerial waterfowl census during the fall migration. Other information was gleaned from casual observations made during visits to some of the Waterfowl Production Areas.

A. Endangered Species

Nothing to report.

B. Migratory Birds

1. Waterfowl

lower than expected on Furnell WPA R&P

With excellent water conditions on all WPA's, spring breeding populations were undoubtedly high. Breeding pair counts were not conducted this year. Aerial brood counts were taken on July 11th and August 15th, the combined results of which are as follows:

TABLE IV

BROOD COUNTS ON WPA'S

Tract	Ducks		Geese	
	Broods	Young	Broods	Young
McCormick	7	27		
Brumwell	21	108		
Peterson	3	8		
Furnell/Aiken	23	152	7	32
Ehli/Collier/Danbrook	32	212		
Totals	86	507	7	32

It was found at Benton Lake that the aerial brood counts taken on the same days recorded 29% of the production based on breeding pair counts. Assuming that this held true for WPA counts, production was figured as follows:

30% X = Y
X = Waterfowl Production
Y = Number Young Observed on Brood Counts

McCormick	X = 27 ÷ 30%	or	90	young produced
Brumwell	X = 108 ÷ 30%	or	360	young produced
Peterson	X = 8 ÷ 30%	or	25	young produced
Furnell/Aiken	X = 152 ÷ 30%	or	500	young produced
Ehli/Collier/Danbrook	X = 212 ÷ 30%	or	700	houng produced
Total Duck Production			1675	
Estimated Goose Production			35	

The only habitat improvement on WPA's has been rest from grazing and two round straw bales placed in the Brumwell wetland in 1977.

An aerial waterfowl census was conducted on several of the fee areas on September 25th. The results are tabulated below:

TABLE V

FALL WATERFOWL CENSUS

WPA	Ducks	Coots	Geese
Brumwell	9,130	150	
Furnell/Aiken	250		75
Ehli/Collier/Danbrook	7,000		
Totals	16,380	150	75

The McCormick and Peterson Tracts were not censused this year.

Spring and summer populations were not monitored.

2. Marsh and Water Birds

There is no census information from which to report on this subject. A horned grebe was observed nesting near the Furnell Tract and a western grebe was seen near the Ehli Tract in September.

3. Shorebirds, Gulls, Terns and Allied Species

There is no census information from which to report on this subject. Several common terns and a long-billed curlew were seen on the Furnell WPA in June. The curlews were suspected of nesting on the WPA.

4. Raptors

Several raptor sightings were recorded for the Furnell Tract this summer. The following raptors were observed:

Ferruginous Hawk	Swainson's Hawk
Rough-legged Hawk	Golden Eagle
Marsh Hawk	Pairie Falcon

5. Other Migratory Birds

Nothing to report.

C. Mammals, Non-Migratory Birds and Others

1. Game Mammals

Mule deer and pronghorns were commonly seen on the Furnell Tract. White-tail deer use the McCormick Tract along the Blackfoot River bottom.

2. Other Mammals

Nothing to report.

3. Resident Birds

Upland game is not prevalent on the WPA's except for the Furnell Tract. Hungarian partridge and sharptail grouse are common on the WPA. The Collier Tract has a sharptail dancing ground which carries approximately 25 to 30 birds, but we have not censused it yet.

4. Other Animal Life

Nothing to report.

V. INTERPRETATION AND RECREATION

A. Information and Interpretation

1. On Refuge

Nothing to report.

2. Off Refuge

Assistant Manager Veikley was interviewed at the Ehli WPA by a reporter from the Pioneer Press in Cut Bank. The results were a fairly well done feature article on the wetland program.

B. Recreation

1. Wildlife Oriented

Some hunting undoubtedly took place on the WPA's but it was not monitored this year. Waterfowl hunting blinds were noted at Brumwell, and upland game and big game hunting were observed at the Furnell WPA. No estimates on harvest are available.

2. Non-Wildlife Oriented

Nothing to report.

C. Enforcement

No violations were processed for the district this year. An apparent easement violation was settled without prosecution and only several spot checks were made during the hunting season.

VI. OTHER ITEMS

A. Field Investigations

Nothing to report.

B. Cooperative Programs

1. Gas Well Development

Three gas wells were drilled in January - one on the Furnell WPA and two on easements just east thereof. They were drilled to about 2500 feet and two were producers. We managed to get the drill sites adjusted slightly to reduce environmental hazards to wetlands. Two of the sites were adequately cleaned up but the WPA site still remains somewhat of a mess. We will hold up right-of-way approval for service lines to this well head until cleanup and restorative grass plantings are completed. The Sun Oil Company developed the well through

Helton Engineering of Billings and Century Drilling of Shelby. The tool pusher was very uncooperative and unconcerned about private property or environmental degredation.

2. Fish planting by the Montana Fish and Game Department was agreed upon and conducted in one deep water pond on the Furnell WPA.

C. Items of Interest

1. Toole County - Crop Depredation Complaint

Very soon after the Ehli Tract was purchased, adjacent ranchers got up in arms and went to the County officials to try to stop our program. We were requested to attend a County Planning Board meeting in Shelby. About thirty people attended including County Commissioners, Planning Board members, reprsentatives of SCS, ASCS, County Extension Agent and ranchers. Realty Specialist Ben Lukes explained our small wetlands program and Manager Bob Pearson discussed management aspects. A long and sometimes heated exchange followed. The crucial points of concern were: 1) Crop depredation would be considerably aggravated by our "duck factory" project on the Ehli marsh. 2) The people hadn't been adequately informed of our program before it was initiated. The main source of opposition appears to have been generated by two or three individuals who were jealous that the Service had bought lands they personally wanted.

A second meeting with the same group which was to provide them with some additional information was held. Added field contacts prior to the meeting with local ranchers, County Commissioners and other individuals pretty well cooled off the problem and the meeting was much calmer. We agreed to do what we could through management of the unit and by providing supplies and advice to reduce crop depredations.

In mid August we received a request for assistance with reported duck depredations in that area. We helped coordinate securing supplies from ADC for the Toole County Extension Agent. We also took some supplies directly to the ranchers that had raised the initial fuss at the Planning Board meetings. We also made an aerial inspection of the area to determine where the "thousands" of ducks were. It appeared that an early pintail migration had moved through the area the previous week. There were no large concentrations other than the local summer birds. It was interesting to note that water habitat south of the Ehli Tract was holding more ducks than the Ehli marsh. That land is owned by the person that complained the loudest about our duck factory.

No further complaints were received and few of the materials were actually used. A recent meeting with the County Commissioners was quite friendly and the affair appears to have been resolved. An increased level of public relations is essential in Toole County.

2. Credits

Sections I, II, III, VI were written by Pearson; III-G, IV, V by Veikley; and I-C acquisition statistical tables, typing and assembly were accomplished by Betty Benway. Content review and editing was shared by all.

D. SAFETY

No reportable accidents associated with district operations. Safety meetings were held in conjunction with Benton Lake NWR.